METROPOLITAN WASHINGTON AIRPORTS AUTHORITY | DULLES INTERNATIONAL

Airport Master Plan

Public Workshop #2

October 11, 2023 | 6:00 PM - 8:00 PM

Washington Dulles International Airport

Significance of IAD on Local / Virginia Economy

Dulles contributed

51,149 jobs and $2.9 billion

in associated labor income in the Commonwealth of Virginia.[2]

Dulles jobs and visitor spending generated

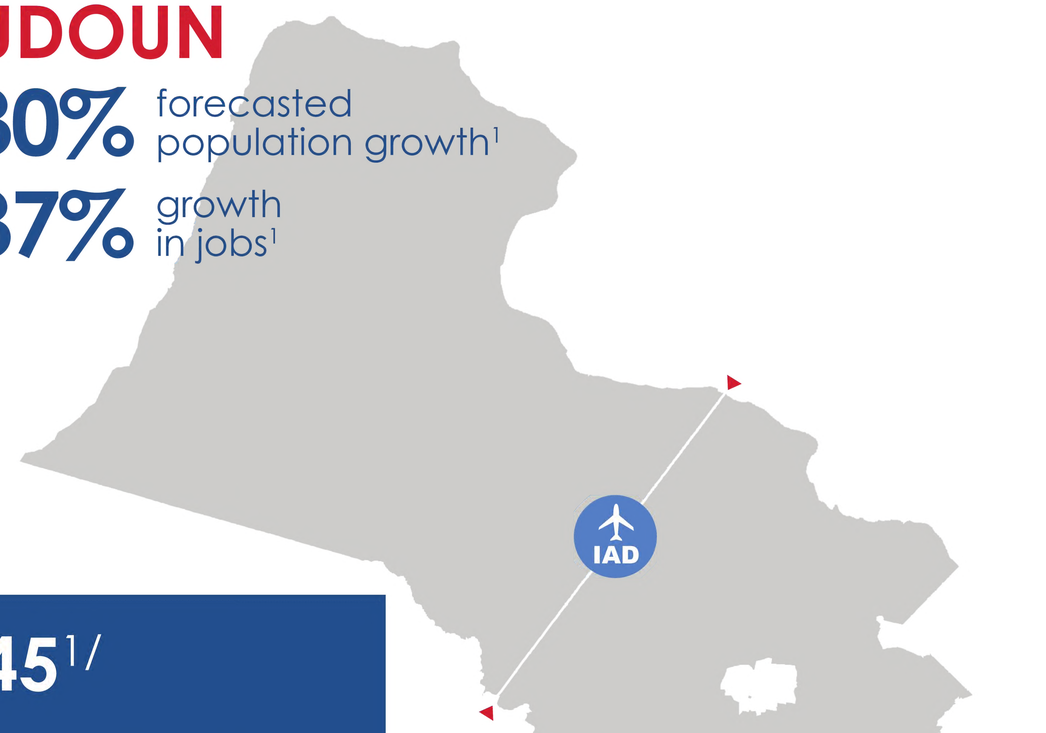
$315 million

in local/state tax revenues.[2]

LOUDOUN

30% forecasted population growth[1]

37% growth in jobs[1]



FAIRFAX

20% forecasted population growth[1]

27% growth in jobs[1]

2045[1/]

+1.5 million people

+1.1 million jobs

+648,000 households

SOURCES:

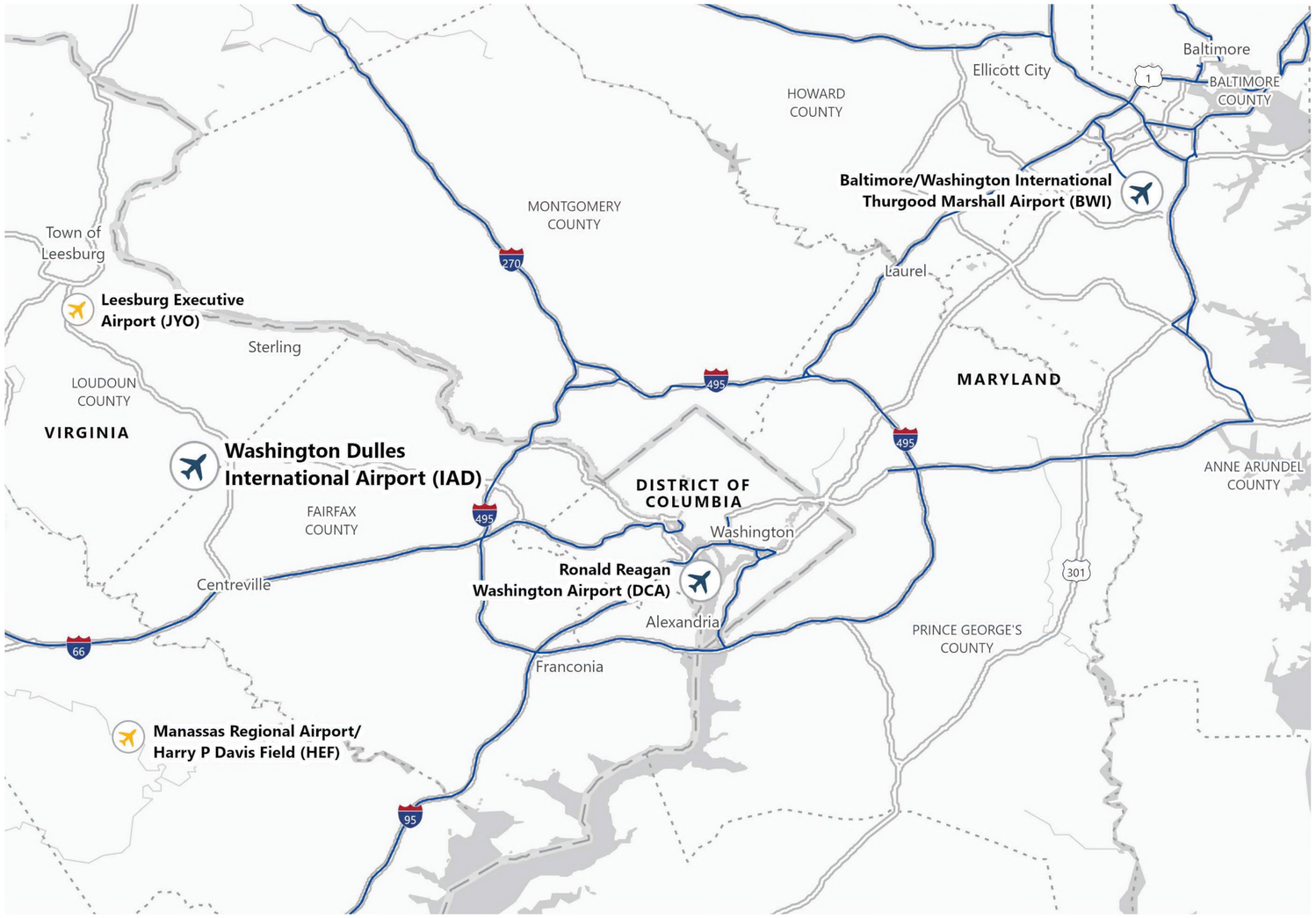
1/ Metropolitan Washington Council of Governments. *Growth Trends to 2045: Cooperative Forecasting in Metropolitan Washington,* June, 2022.

2/ Commonwealth of Virginia. Virginia Department of Aviation. *Virginia Airport System Economic Impact Technical Report.* May 2018.

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Regional Airports

- **Washington Dulles International Airport**
  The National Capitol Region's international gateway Airport and hub for United Airlines, operated by MWAA
- **Ronald Reagan Washington National Airport**
  The smaller of the two airports operated by MWAA, serves as the domestic hub for American Airlines
- **Baltimore/Washington International Thurgood Marshall Airport**
  International airport serving the Baltimore-Washington Metropolitan Area and a focus city for Southwest Airlines
- **Leesburg Executive Airport**
  Busy general aviation airport in the Washington DC area and reliever airport for Washington Dulles
- **Manassas Regional Airport**
  Largest general aviation airport in Virginia and reliever airport for Washington Dulles



Legend

Commercial Service Airport

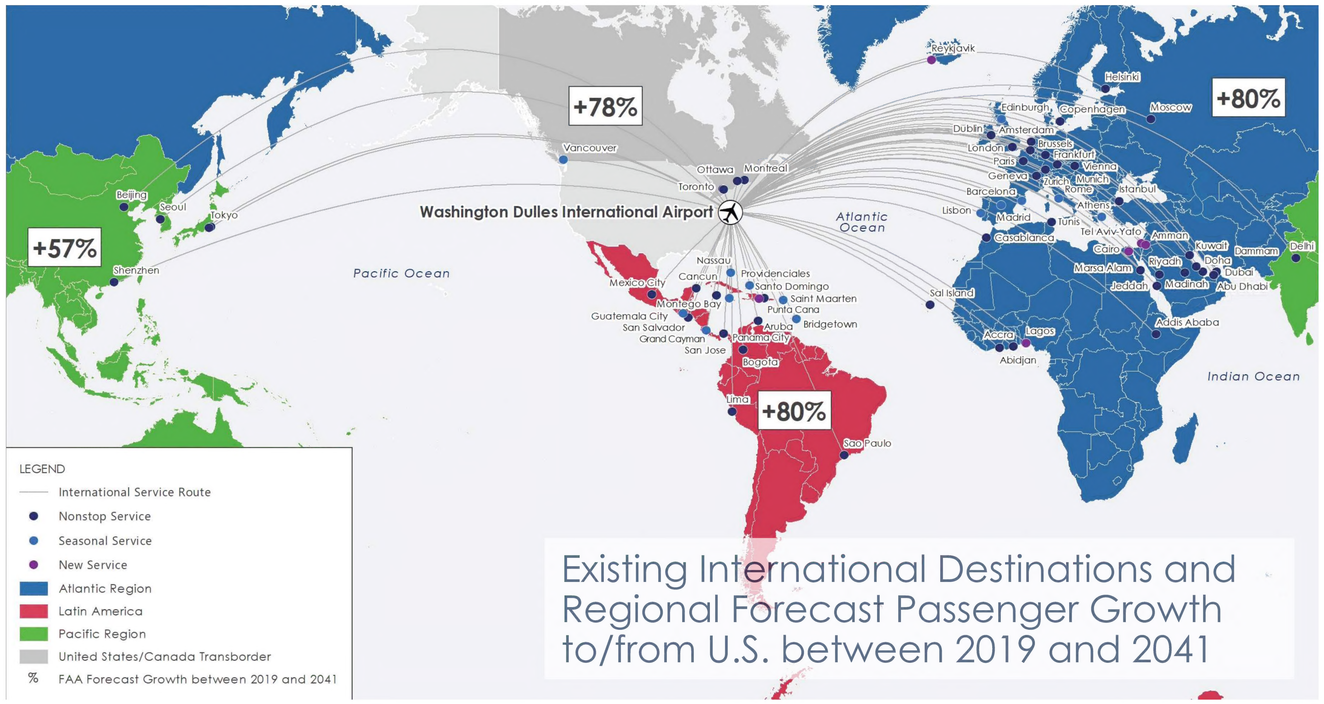
General Aviation Airport

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Air Service Continues to Grow

Potential Passenger Service Expansion Opportunities

- Airline hub expansion
- International service expansion
- Growth in local demand and domestic connecting flights for international passengers



Existing International Destinations and Regional Forecast Passenger Growth to/from U.S. between 2019 and 2041

SOURCES: Esri, HERE, DeLorme, MapmyIndia, OpenStreetMap contributors, and the GIS user community, May 2018 (basemap); MWAA, March 2022 (international non-stop destination data); OpenFlights.org, March 2022 (flight arcs); National Science Foundation, National Institutes of Health, 2016 (countries); FAA Aerospace Forecast Fiscal Years 2021 – 2041, Federal Aviation Administration, May 2021 (forecast growth in passengers between 2021 and 2041).

Potential Cargo Service

- Medium-size hub for one integrated cargo carrier
- Expansion of international cargo carriers
- Addition of an eCommerce cargo carrier

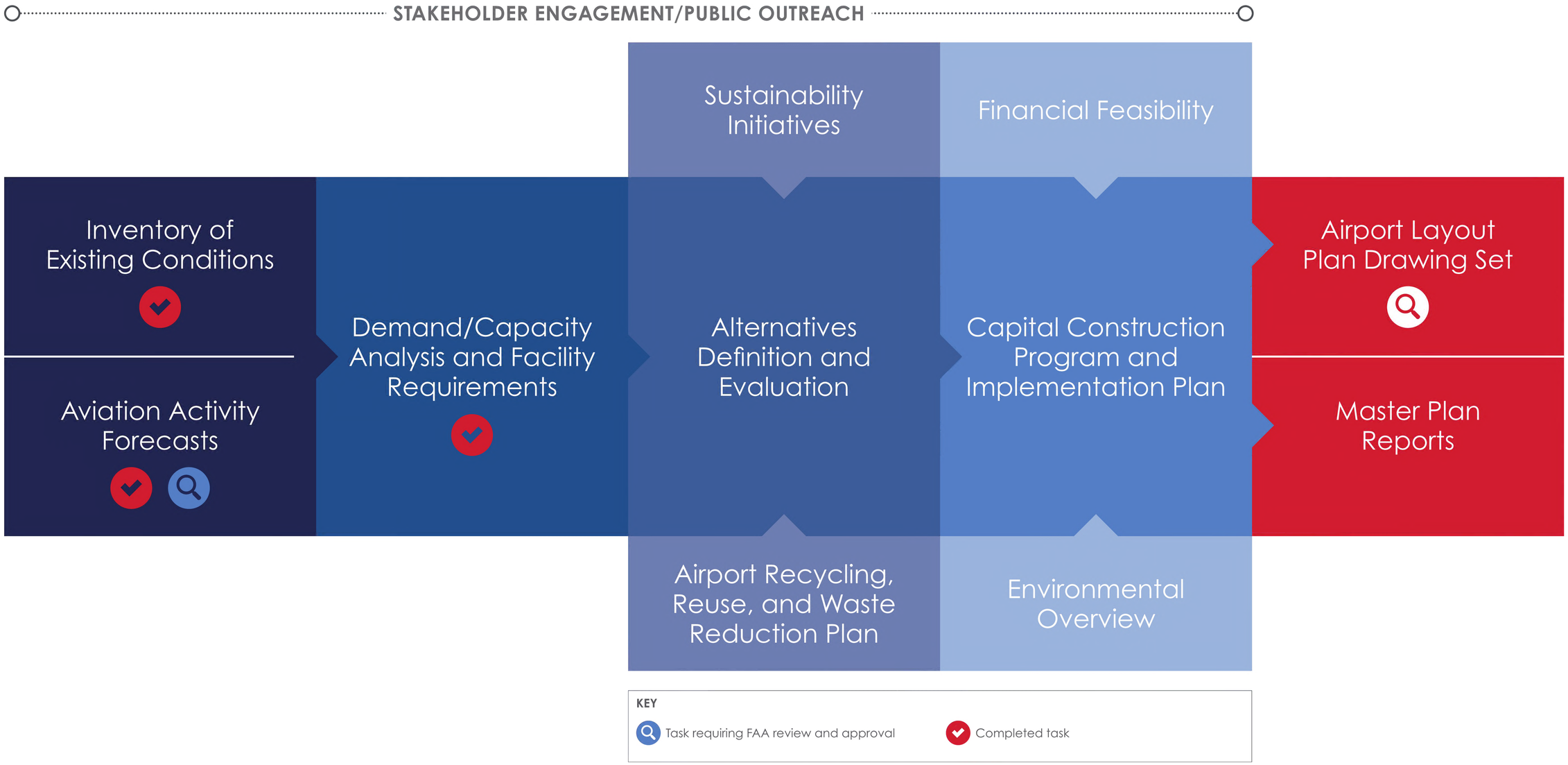


SOURCE: MWAA, 2015 Air Service Development Industry and Community Briefing, November 2014

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IAD Master Planning Process

The Master Plan is a multi-year process that is planned to conclude by the end of 2024.



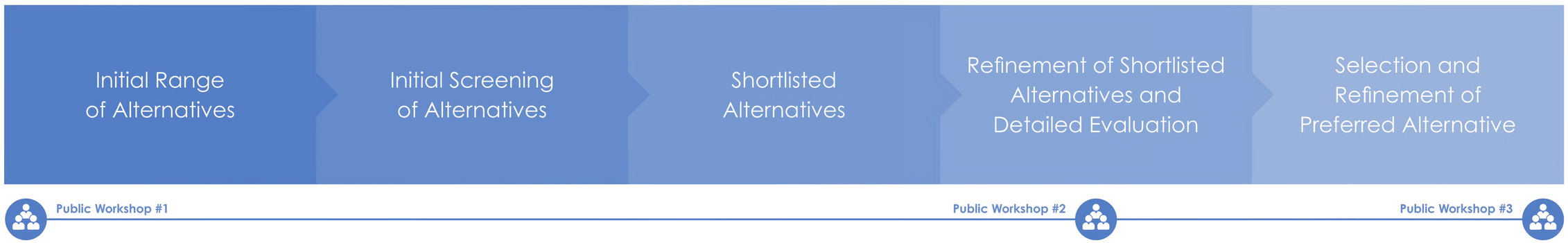
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Public Workshop Milestones

Overall Master Plan



Alternatives Definition, Evaluation, and Selection



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Master Plan Development Priorities

> An airport master plan is a comprehensive study of an airport and usually describes the short-, medium-, and long-term development plans to meet future aviation demand.
>
> — *FAA ADVISORY CIRCULAR 150/5070 – 6B AIRPORT MASTER PLANS*

- The focus of the Master Plan is to address long-term (25+ years) needs by establishing a roadmap for development to meet future demand.
- Development goals and priorities were formulated to guide the Master Planning process to ensure the resulting analyses and recommendations are aligned with the Airport Authority's strategic business plans and initiatives.
- Other considerations may include the highest and best use of existing infrastructure given long-term development plans.

EFFICIENT

Expedite and simplify the movement of aircraft, passengers, vehicles, baggage, cargo, and consumer goods (concessions).

DIVERSIFIED

Increase the Airport's revenue base by expanding its aeronautical service offerings and facilitate non-aeronautical development opportunities.

BALANCED

Achieve and maintain a balance in the capacity of facilities with associated demand levels.

FLEXIBLE

Ensure facilities can be configured in a manner that allows them to adjust to varying demand levels and user needs.

INTEGRATED

Enhance the Airport's role as a regional asset, sensitive to the needs of the local community and compatible with regional transportation initiatives.

MODERNIZED

Upgrade and/or replace outdated facilities and infrastructure in a financially viable manner.

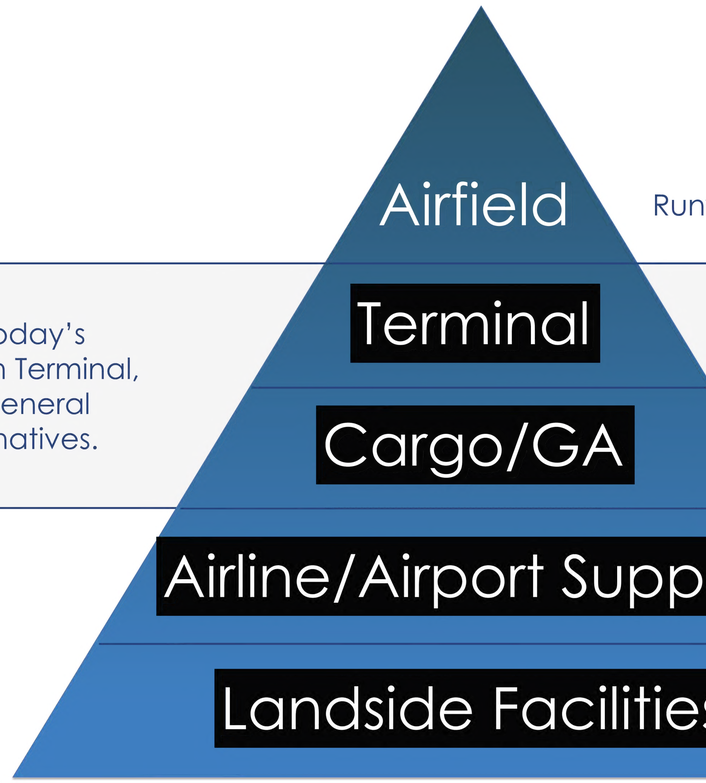
SUSTAINABLE

Develop the Airport's facilities and infrastructure in a sustainable manner.

RESILIENT

Construct facilities and infrastructure while reducing the Airport's vulnerabilities and known risks.

Master Planning Decision Making Hierarchy



Runways, Taxiways, and other Aircraft Movement Areas

Main Terminal, Concourses, Aircraft Parking Aprons, and Passenger Conveyance Systems

All-Cargo and Belly Cargo Facilities, General Aviation (GA) and Corporate Aviation Facilities

Maintenance Facilities, Ground Service Equipment Storage, Fueling Systems, Administrative Spaces, and Public Safety Facilities

Ground Access, Roadways, Parking Facilities, and Vehicle Staging Areas

The focus of today's workshop is on Terminal, Cargo, and General Aviation Alternatives.

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Airfield Needs

Runway System

The planned 5th runway will improve the operational efficiency of the airfield, by:

- increasing the Airport's capacity,
- reducing operational delays,
- enhancing the ability to balance aircraft arrival and departure operations, and
- mitigating greenhouse gas emissions.

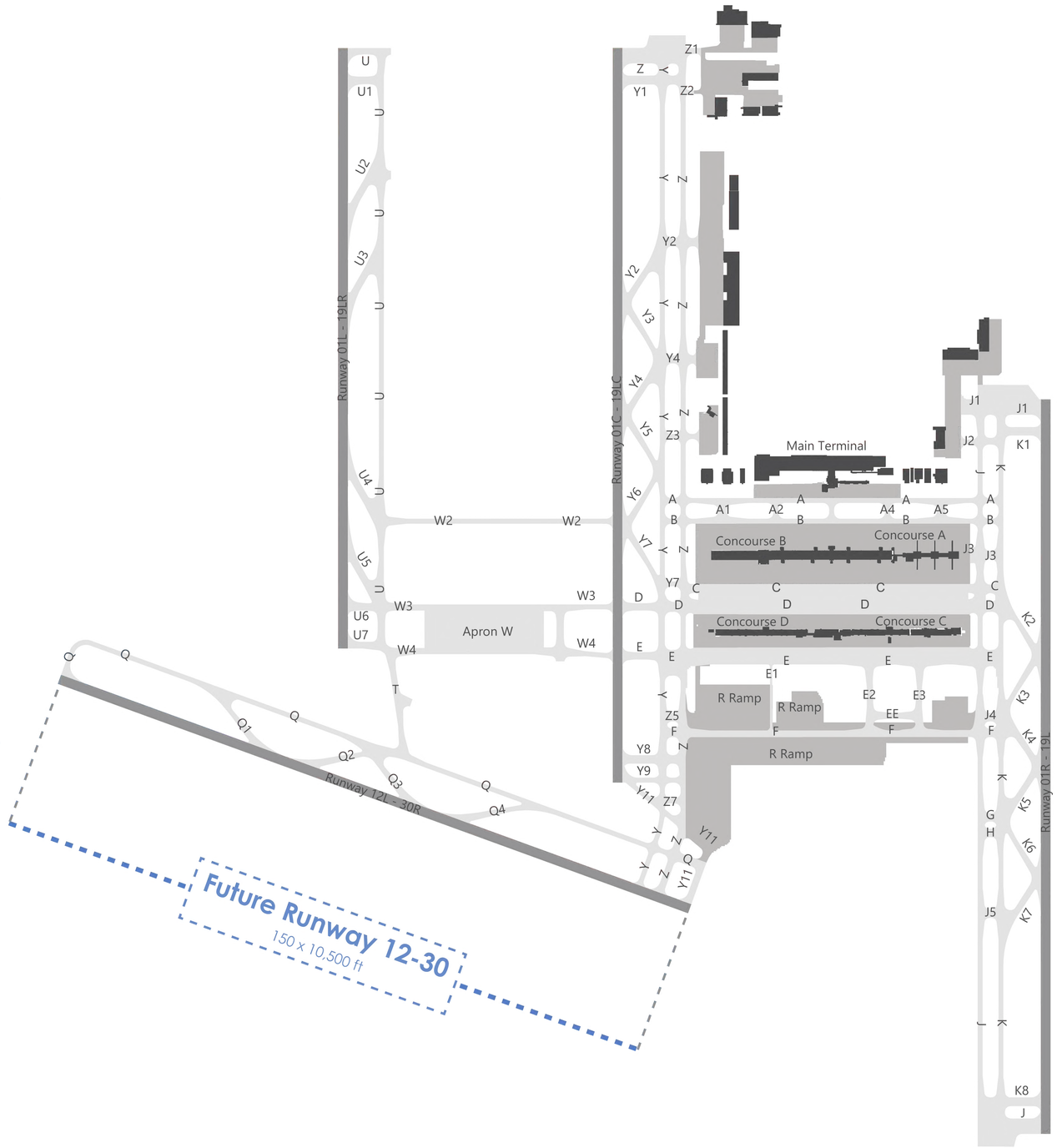
The master plan will evaluate the timing of the 5th runway.

Taxiway System

The existing taxiway system is considered adequate to serve existing and projected demand.

The only modifications this Master Plan will evaluate are:

- compliance with FAA design standards,
- Airfield circulation enhancements, and
- accessibility to future aeronautical facilities development.

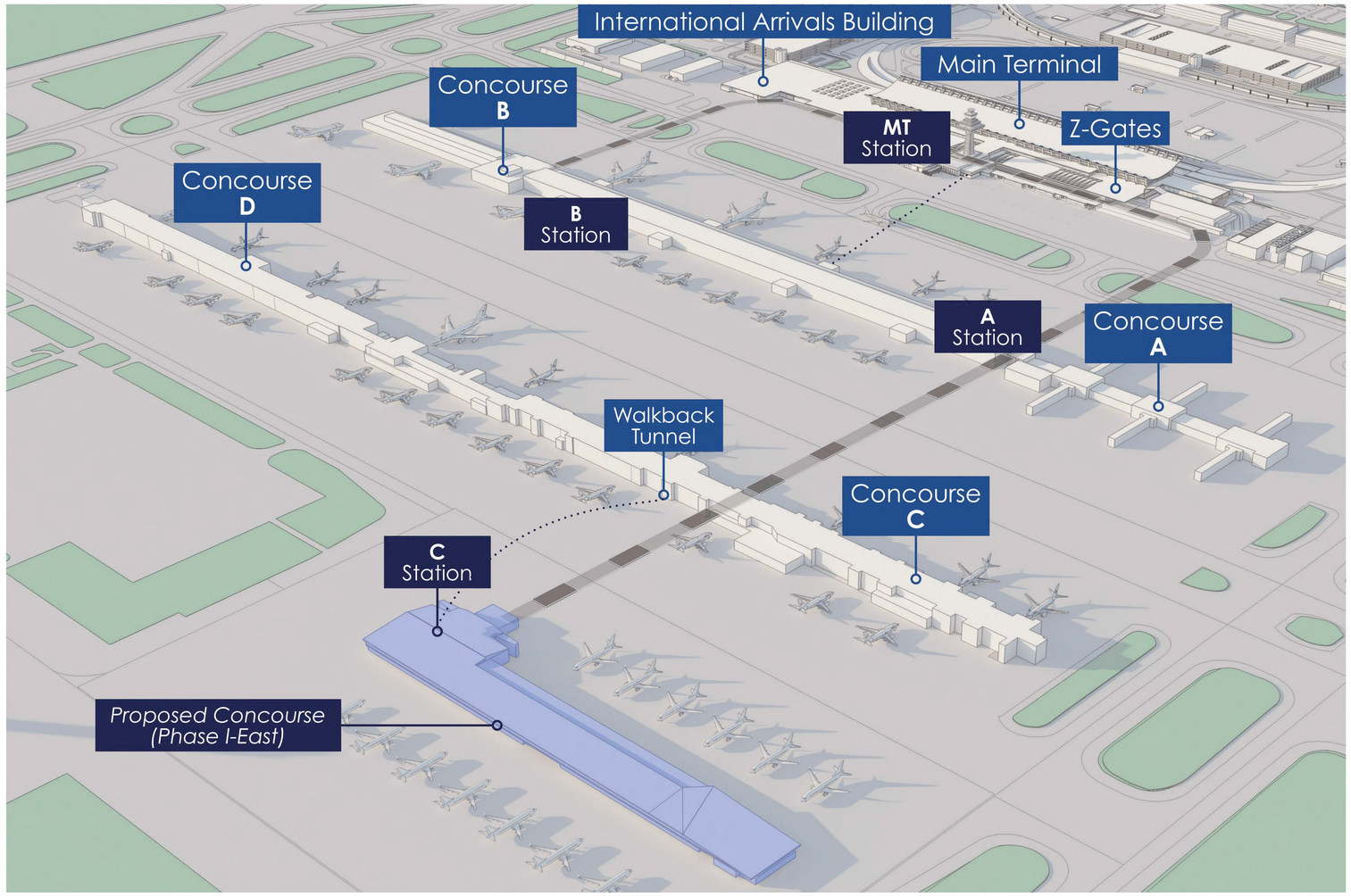


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Passenger Terminal Complex

Primary Components

- **Main Terminal**
  Primary function to process passengers and baggage
  - Airline Check-in
  - Security Screening
  - Baggage Handling Systems
  - Federal Inspection Services
  - Terminus of AeroTrain and Mobile Lounges
- **Concourses**
  Aircraft enplaning and deplaning area
  - Passenger Holdrooms
  - Concessions
  - Airline Clubs and Other Amenities
- **Passenger Conveyance Systems**
  Movement of passengers between Main Terminal and Concourses
  - AeroTrain
  - Mobile Lounges
  - Plane Mates



NOTE: MT - Main Terminal

Legend

- Passenger Processing Facilities
- AeroTrain Station
- AeroTrain Tracks
- Pedestrian Tunnel

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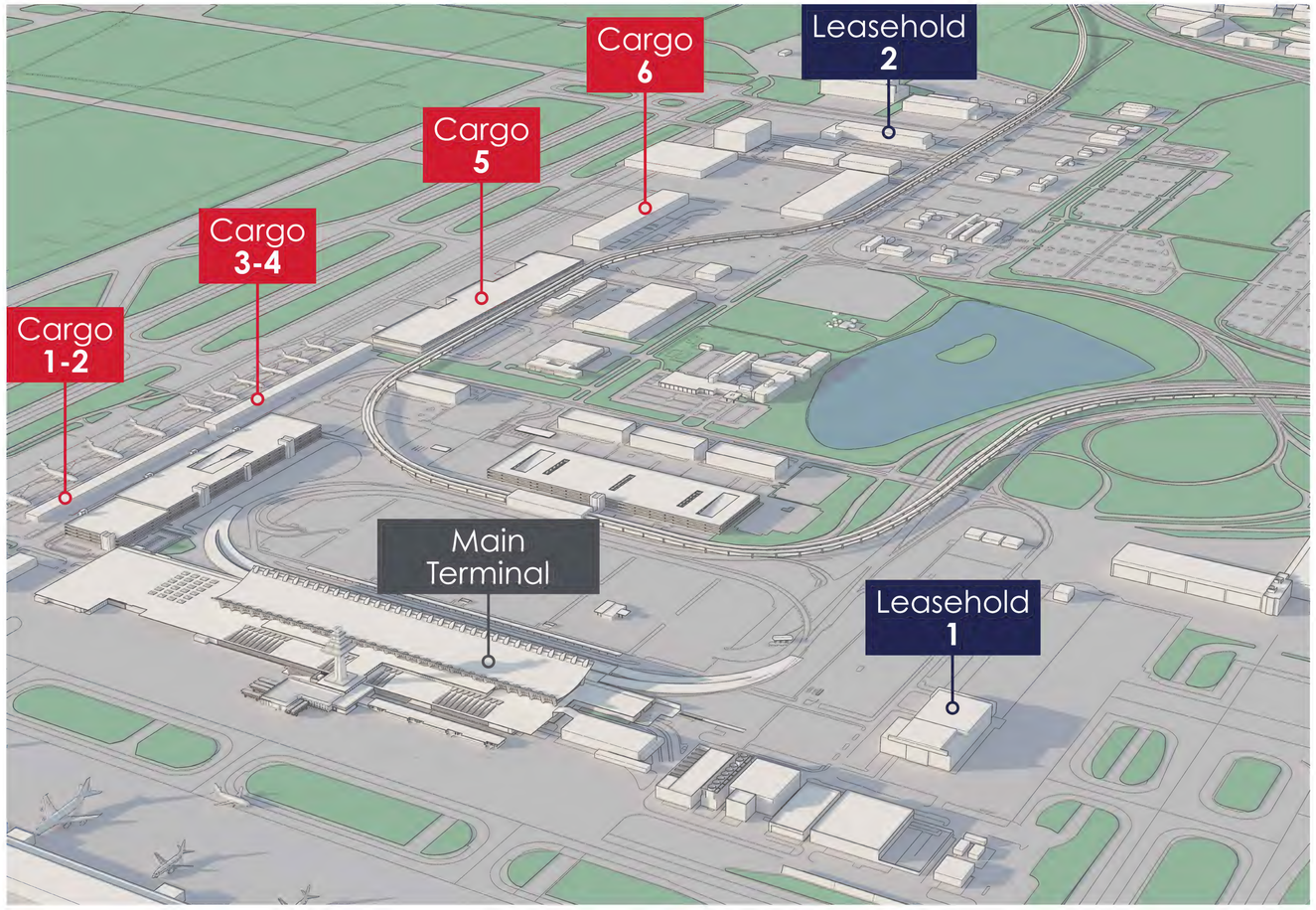
Air Cargo and General Aviation Facilities

Air Cargo

- The Cargo facilities are comprised of six warehouse buildings, truck docks, and aircraft parking areas.
- These facilities were constructed incrementally since the Airport's initial development in 1962.
- Many of the facilities are in a state of disrepair and functionally outdated.
- This Master Plan will evaluate the needs to meet projected 2045 air cargo demands, with consideration for replacing old and antiquated facilities.

General Aviation

- General Aviation (GA) facilities include the fixed base operators (FBOs) that provide non-airline service to IAD, including private and leisure flights and corporate aviation. At IAD, corporate jets make up the largest share of the GA operations.
- This Master Plan will evaluate the needs to meet projected 2045 GA demand.



Legend

- Cargo Facilities
- General Aviaiton Facilities

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Development Opportunities Areas and Constraints

Each of these areas have potential for aeronatutical and non-aeronautical developments.

Northwest Development Area

The Northwest Development Area includes developable lands to the west of Runway 1L-19R and between Runways 1L-19R and 1C-19C.

North Development Area

The North Development Area serves as the primary public access point for the Airport. It includes the ground access roadways, parking facilities, metro station, rental car facilities, and other "landside" functions. Areas adjacent to the IAD Airfield are generally utilized for cargo, general aviation, and airport/airline support functions. Any future development in this area will be associated with these land uses.

West Development Area

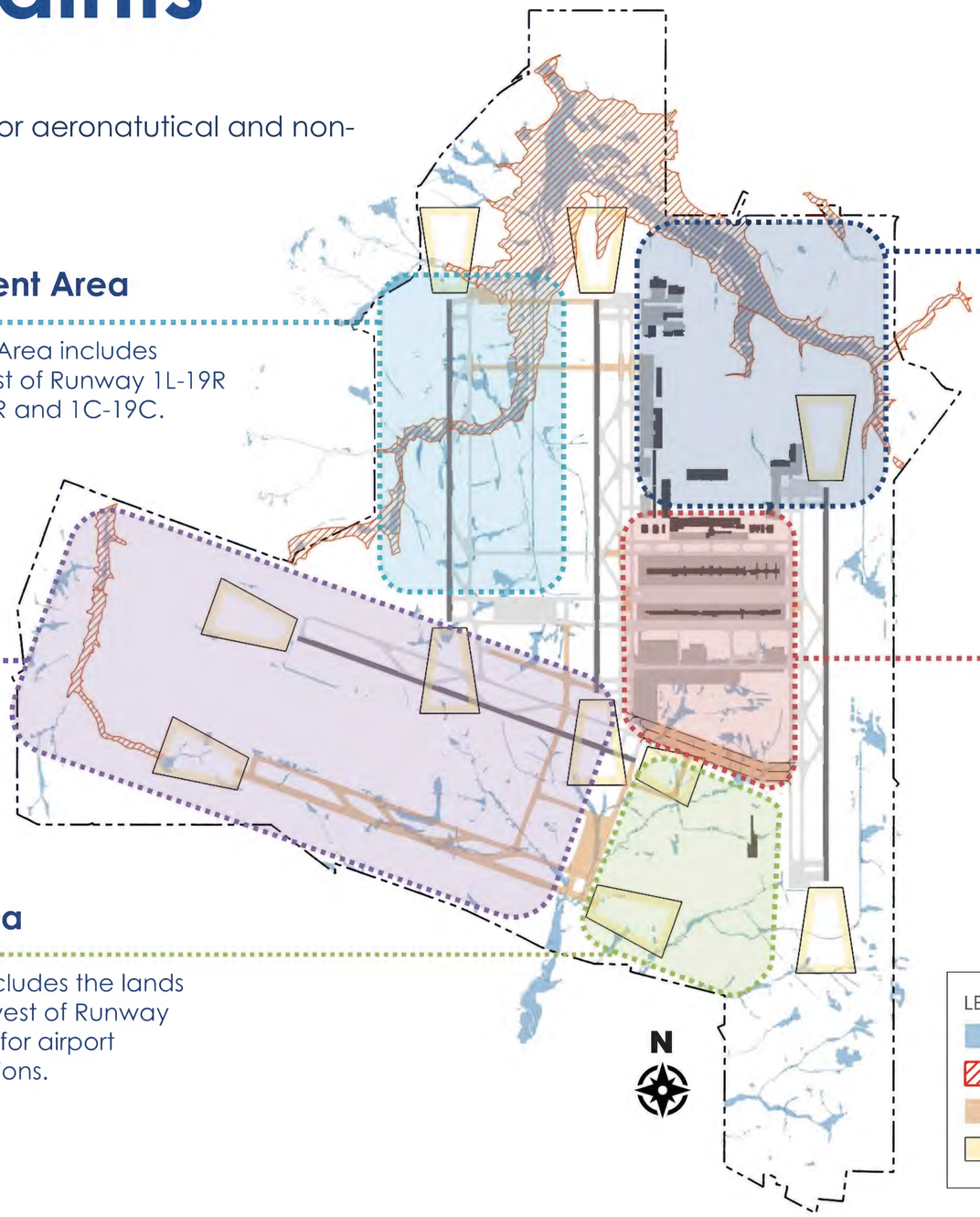
The West Development Area includes the lands surrounding Runway12-30 and the future parallel runway.

Central Development Area

The Central Development Area includes the Passenger Terminal, Concourses, and is general utilized for "airside" functions. Any future development in this area will be associated with these land uses.

South Development Area

The South Development Area includes the lands south of the terminal area and west of Runway 1R. This area is generally utilized for airport maintenance and support functions.



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Enplaned Passenger Forecasts

- **Baseline Forecast**
  Estimates future airport activity predominantly based on trend analysis of historical activity, with consideration of IAD of existing share of the Washington Metropolitan Area's demand for air service, socioeconomic data, and local/national trends.
- **Accelerated Baseline Forecast**
  Considers current air service development initiatives.
- **Federal Aviation Administration (FAA) Terminal Area Forecast (TAF)**
  Independent forecast generated for federal funding and FAA staffing purposes.

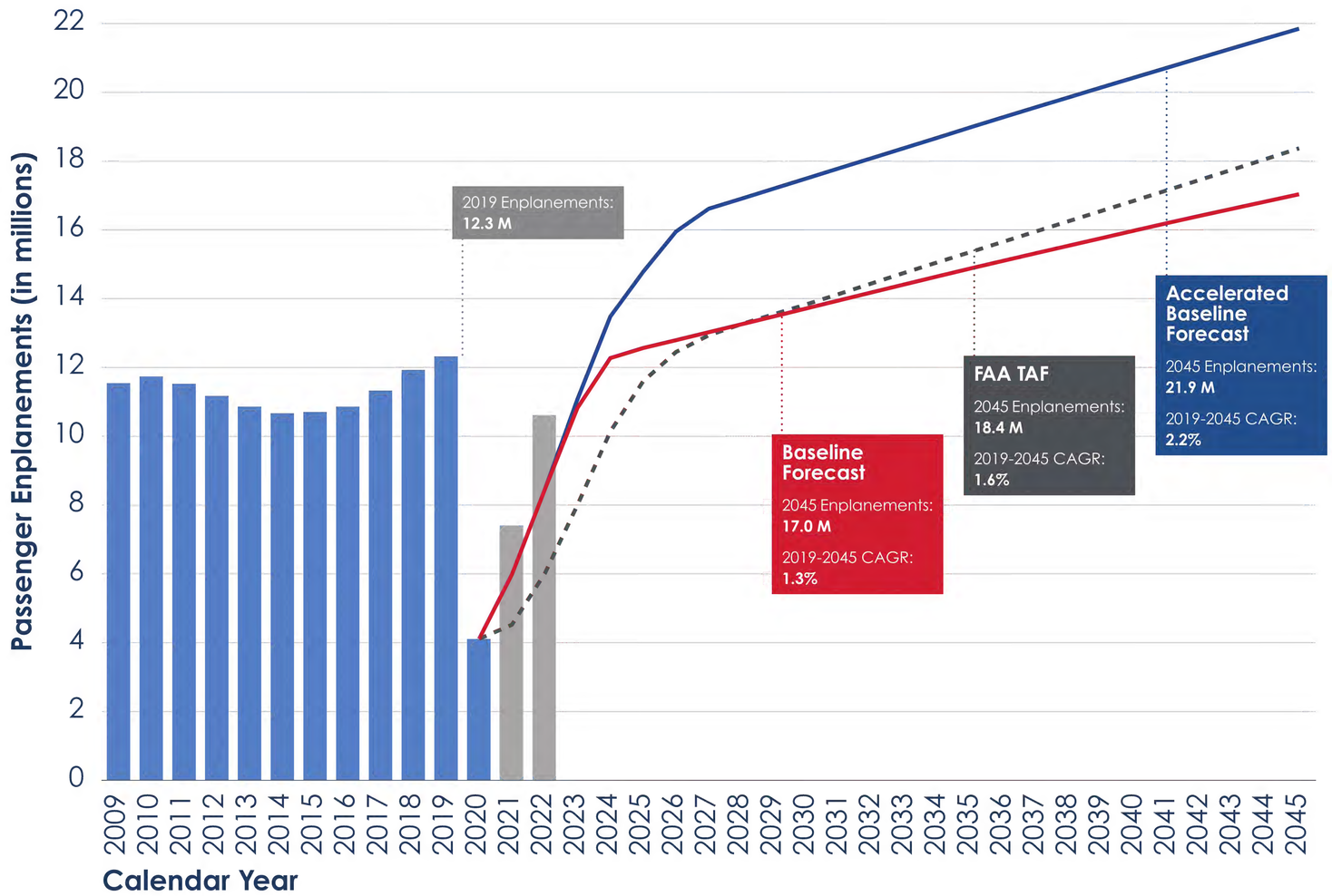
Legend

- Historical Operations - post forecast
- Historical Operations
- Baseline Forecast
- Accelerated Baseline Forecast
- FAA TAF

NOTES: Federal Aviation Administration Terminal Area Forecast (TAF) represents revenue passengers and is presented in federal fiscal year (October 1 to September 30).
CAGR - Compound Annual Growth Rate
FAA - Federal Aviation Administration
TAF - Terminal Area Forecast

SOURCES: Metropolitan Washington Airport Authority, October 2020; Federal Aviation Administration, Terminal Area Forecast FY 2020 – 2045, May 2021; Ricondo & Associates, Inc., November 2020.

Annual Passenger Enplanements



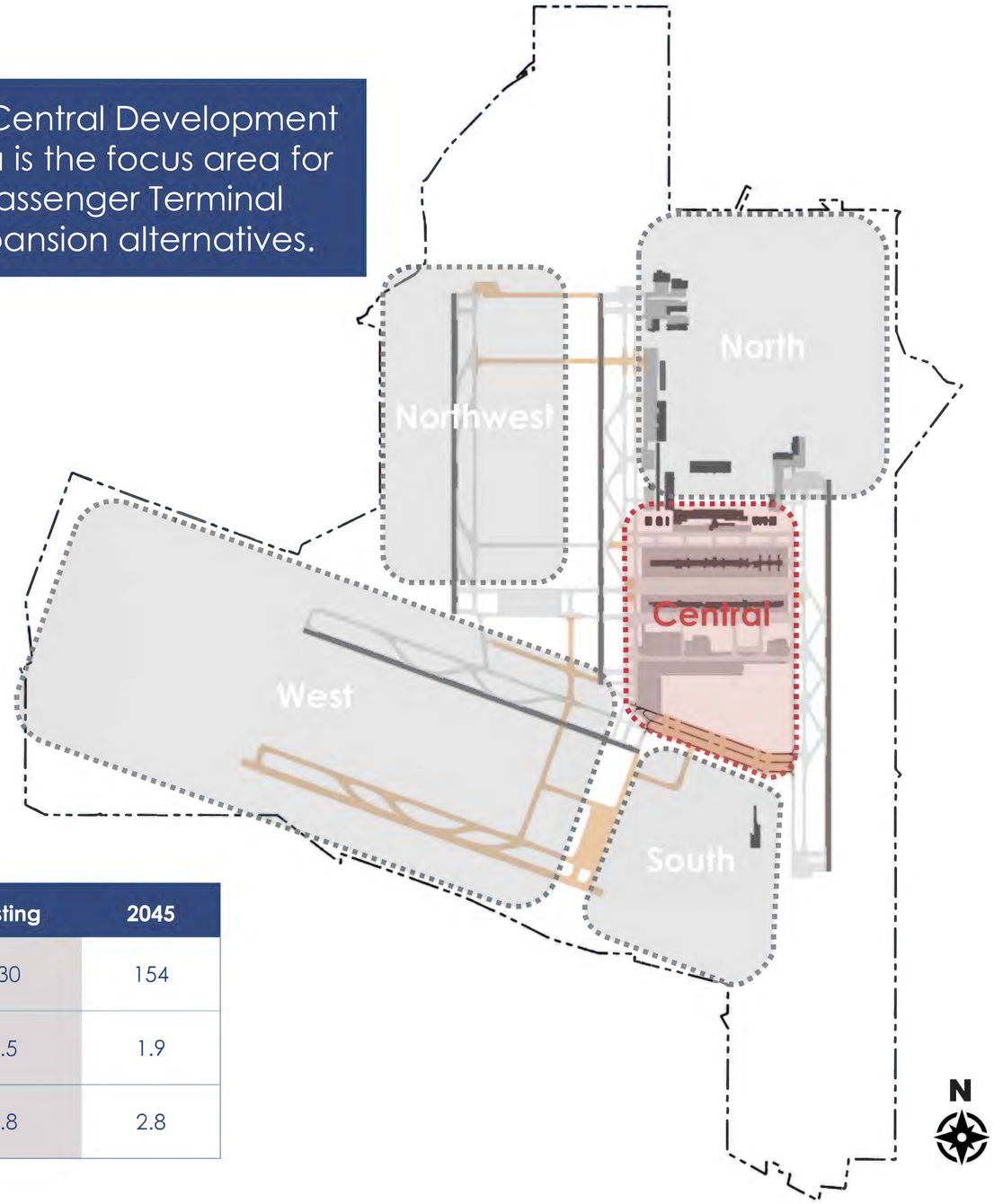
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Passenger Terminal Alternatives Focus

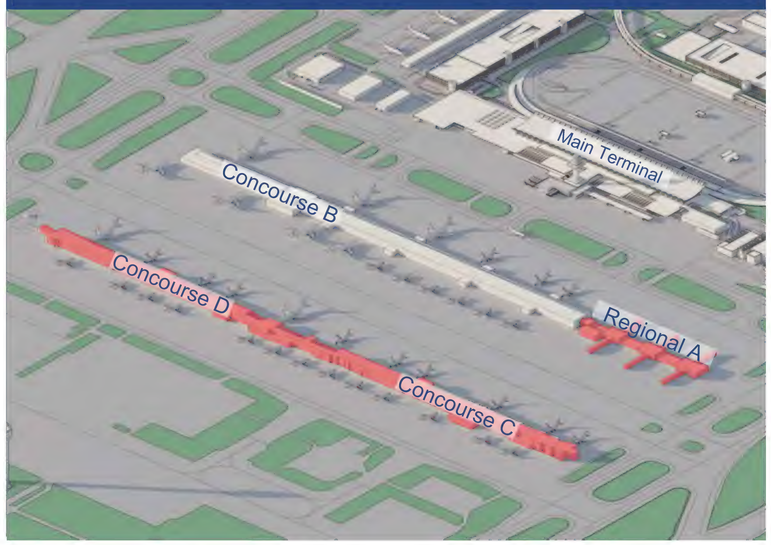
Passenger Terminal Goals and Priorities:

- Provide 150+ aircraft gates by 2045
- Replace or modernize Concourses C, D, and Regional A
- Improve passenger experience by making IAD feel "smaller", simplifying everything, and minimizing travel distances
- Enhance revenue generation opportunities
- Promote outstanding architecture that is empathetic to IAD's historic Main Terminal

The Central Development Area is the focus area for Passenger Terminal expansion alternatives.



It is anticipated that Concourse C/D and the Regional A concourse will be demolished and replaced.



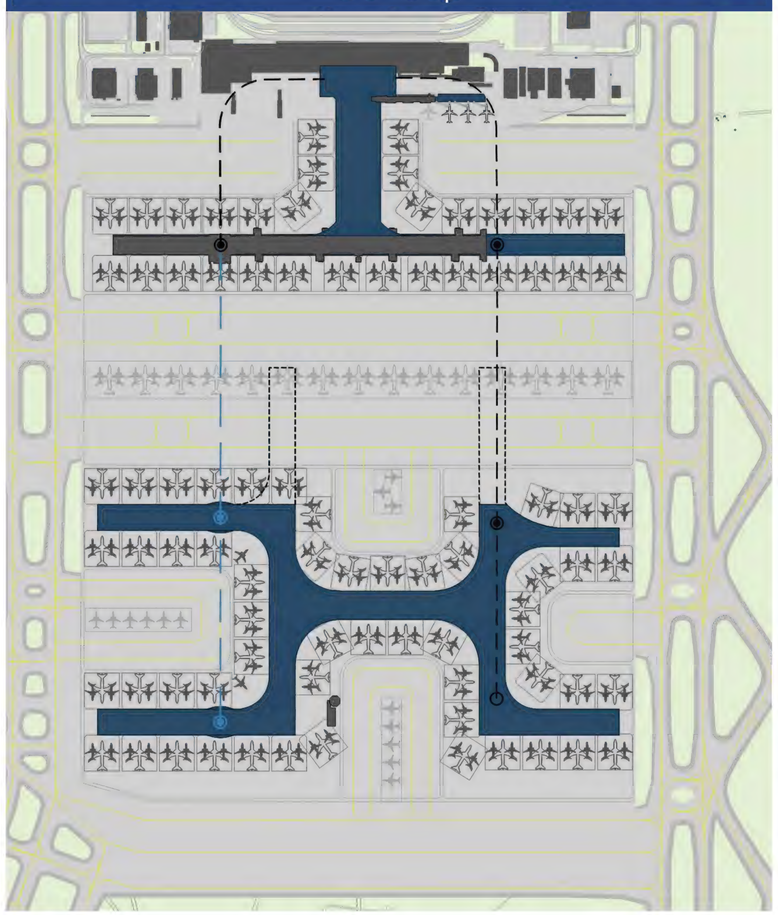
Terminal Requirements	Existing	2045
Narrowbody (Aircraft) Equivalent Gates	130	154
Main Terminal (million sq ft)	1.5	1.9
Concourses (million sq ft)	1.8	2.8

PAL – Planning Activity Level

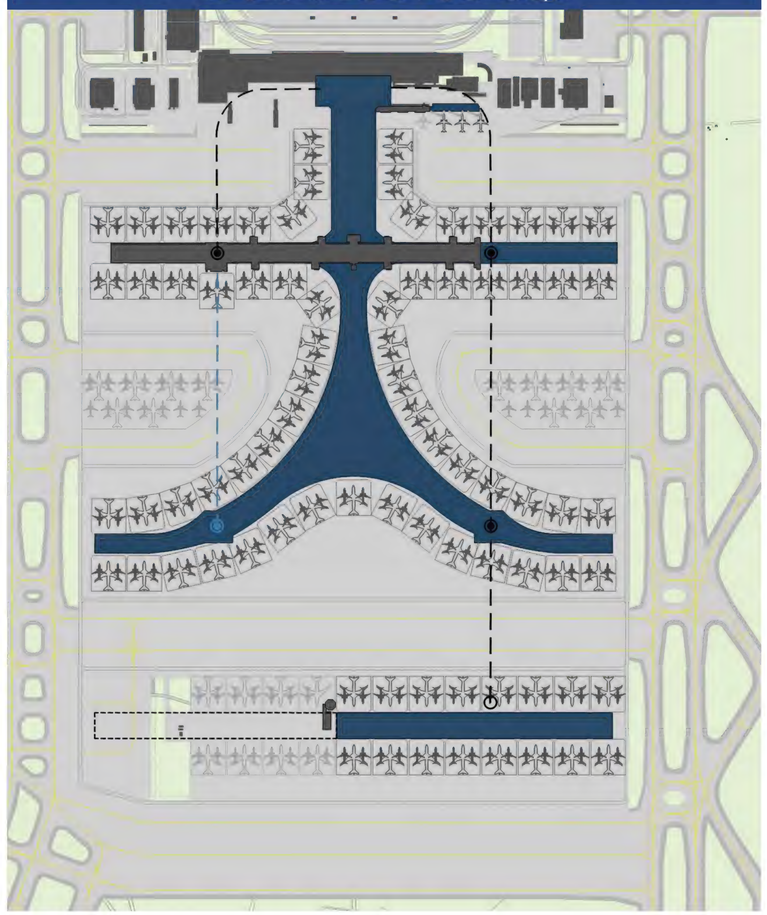
Notes:
[1] narrowbody-equivalent gates

Shortlisted Terminal Development Alternatives

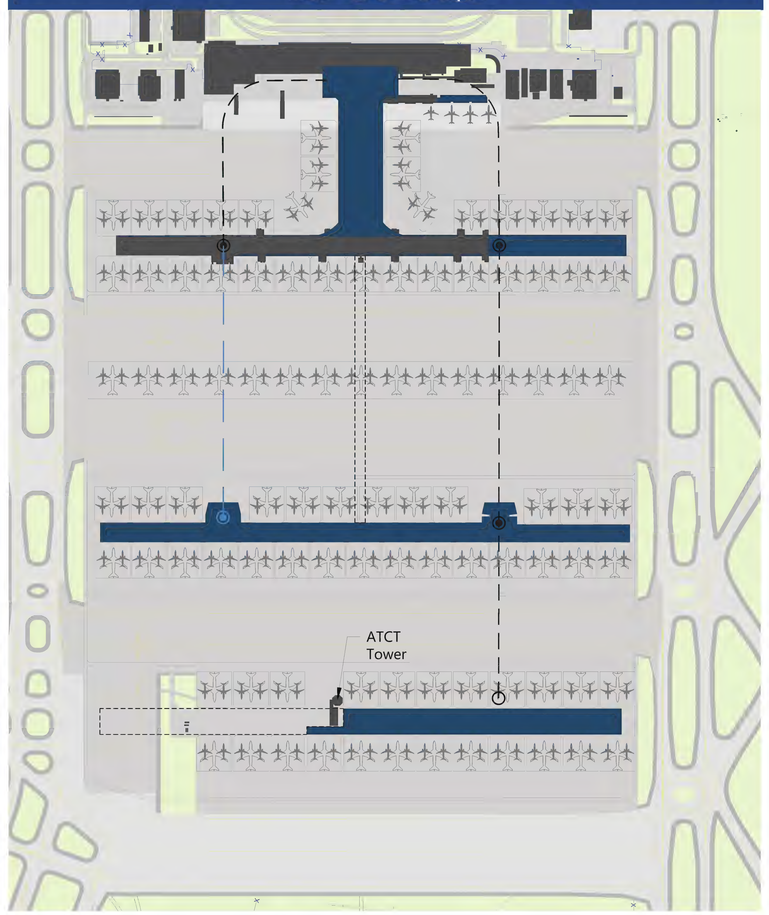
H Concept



Heaven/Vision Concept



Tier Concept



NORTH

Legend

- Existing Building
- Future Building
- Ultimate Building
- Contact Gates
- Remain-Over-Night (RON)
- Existing AeroTrain
- Future AeroTrain
- Existing AeroTrain Station
- Existing AeroTrain Station (existing shell – no buildout)
- Future AeroTrain Station

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Heaven/Vision Concept



Source: Google Earth Pro, 2020; GeoEye, 2020; TerraMetrics, 2020 (aerial photography – for visual reference only, may not be to scale).



H Concept





Source: Google Earth Pro, 2020; GeoEye, 2020; TerraMetrics, 2020 (aerial photography – for visual reference only, may not be to scale).

Tier Concept

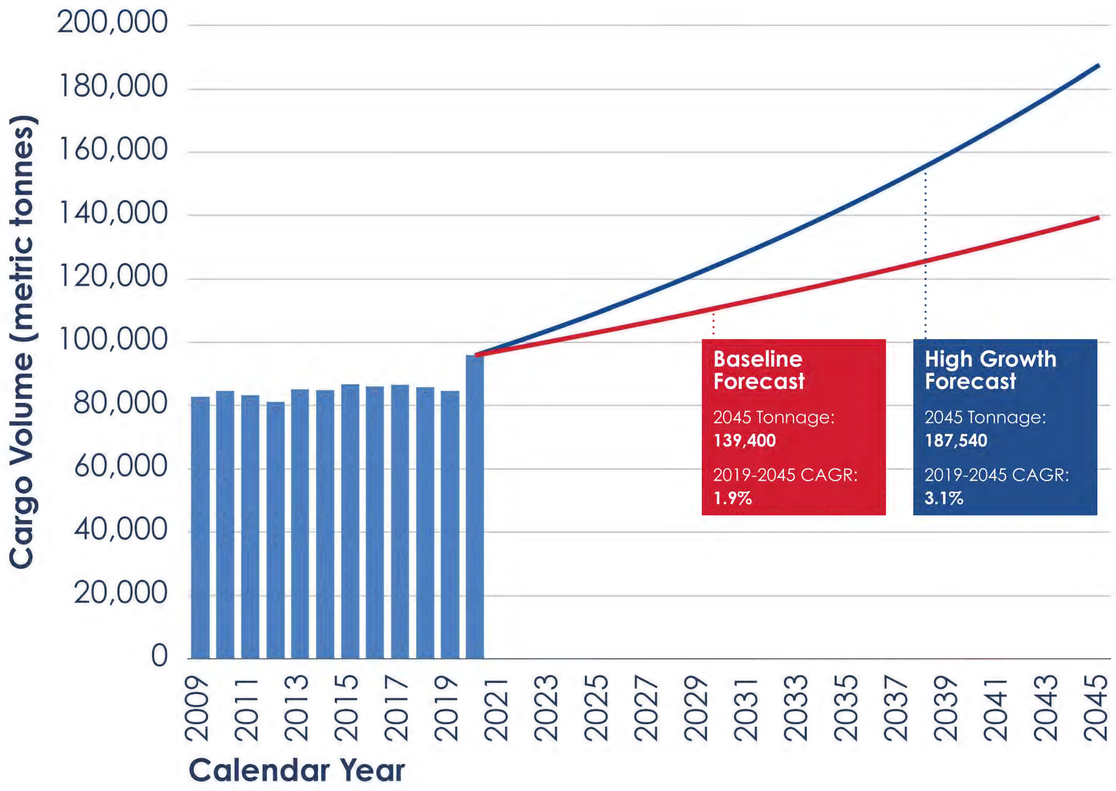


Source: Google Earth Pro, 2020; GeoEye, 2020; TerraMetrics, 2020 (aerial photography – for visual reference only, may not be to scale).

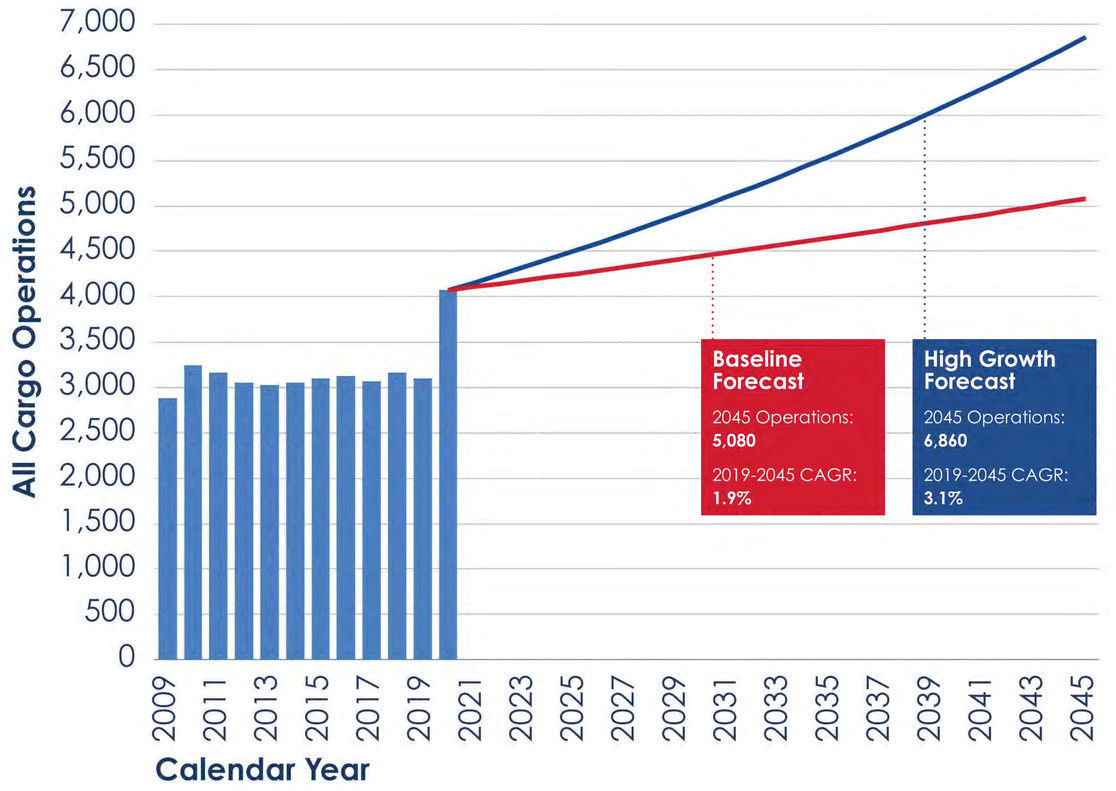


Air Cargo Forecasts

Annual Cargo Tonnage



Annual Cargo Operations



Master Plan Focus

- Construct additional facilities to accommodate projected growth
- Replacement of antiquated cargo facilities
- A total of 94 acres anticipated to meet 2045 demand

Legend

- Historical
- Baseline Forecast
- High Growth Forecast

NOTE: CAGR - Compound Annual Growth Rate

SOURCES: Metropolitan Washington Airport Authority, October 2020; Innovata (US DOT T-100 data), July 2021; Ricondo & Associates, Inc., July 2021.

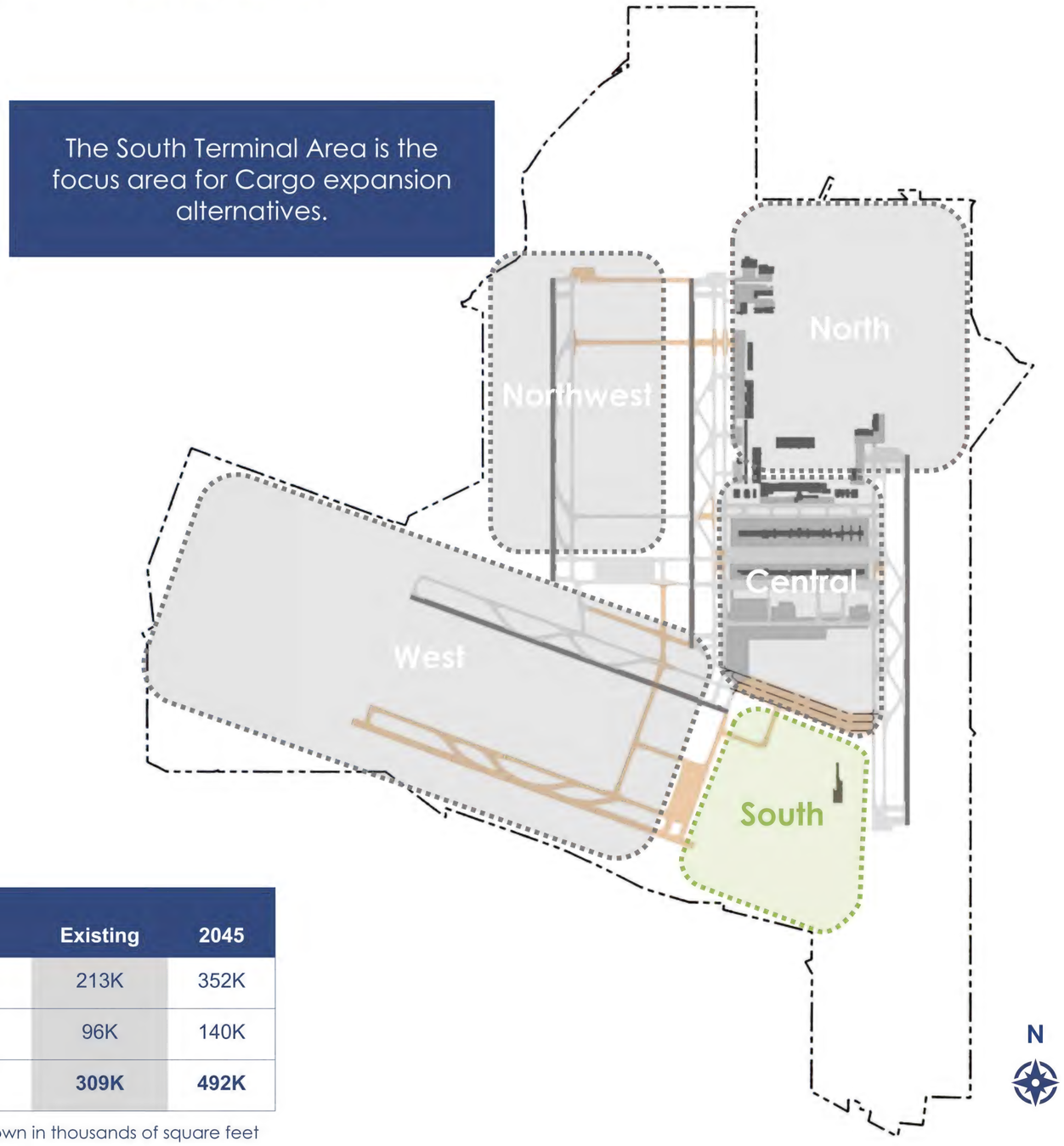
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Air Cargo Alternatives Focus

General Development Goals and Priorities:

- Construct additional facilities to accommodate projected growth
- Replace antiquated cargo warehouses with state-of-the-art facilities employing the latest technology and specialized handling equipment
- Position IAD to accommodate potentially underserved air cargo markets

The South Terminal Area is the focus area for Cargo expansion alternatives.



It is anticipated that Cargo 1-4 will be demolished, replaced, or repurposed.



Warehouse Requirements	Existing	2045
Belly Cargo (sq ft)	213K	352K
All-Cargo (sq ft)	96K	140K
Total (sq ft)	**309K**	**492K**

Note: Requirements shown in thousands of square feet (sq ft)

Cargo Development Alternatives

Alternative 1:
Maintain and Optimize Cargo Buildings 5 and 6

Prioritize for All-Cargo Airlines:
- Integrator / Express (door to door)
  - FedEx, UPS, DHL
- Middle-Mile / Last-Mile Carrier
  - Amazon Air
- Traditional Line Haul (airport to airport)
  - Kalitta, Cargolux, Polar, etc.
- Combination Carriers (Freighters)
  - Korean Air, China Airlines, Air China, EVA, etc.

Advantages:
- Would satisfy 2045 demand levels
- Allows for full amortization of assets
- Avoids or defers capital investment in new facilities
- Ability to accommodate one B747-8 aircraft

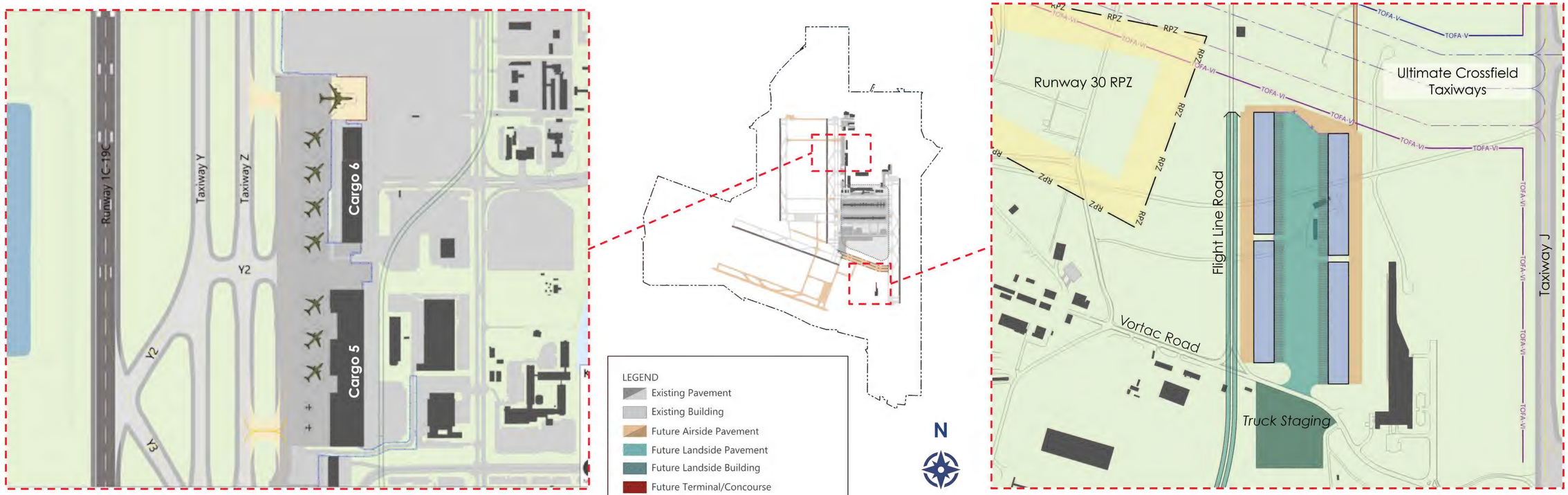
Disadvantages:
- Maintains truck access though the terminal area
- Constrained aircraft parking apron

Alternative 2:
Immediately South of Passenger Terminal

Prioritize for Air Carrier Cargo Providers:
- Belly Cargo Carriers
  - United, Southwest, Delta, American, etc.
- Combination Carriers (Belly)
  - Korean Air, China Airlines, Air China, EVA, etc.

Advantages:
- Would satisfy 2045 demand levels
- Optimizes cargo handling operations and travel times
- Leveraging existing roadway and utility infrastructure

Disadvantages:
- Requires capital investment to be amortized



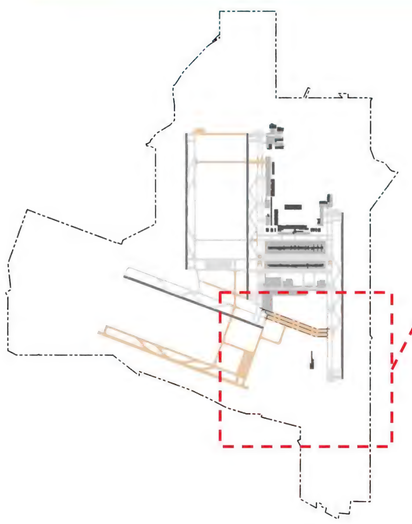
Note: Each hanger is 135,000 square feet (as drawn).

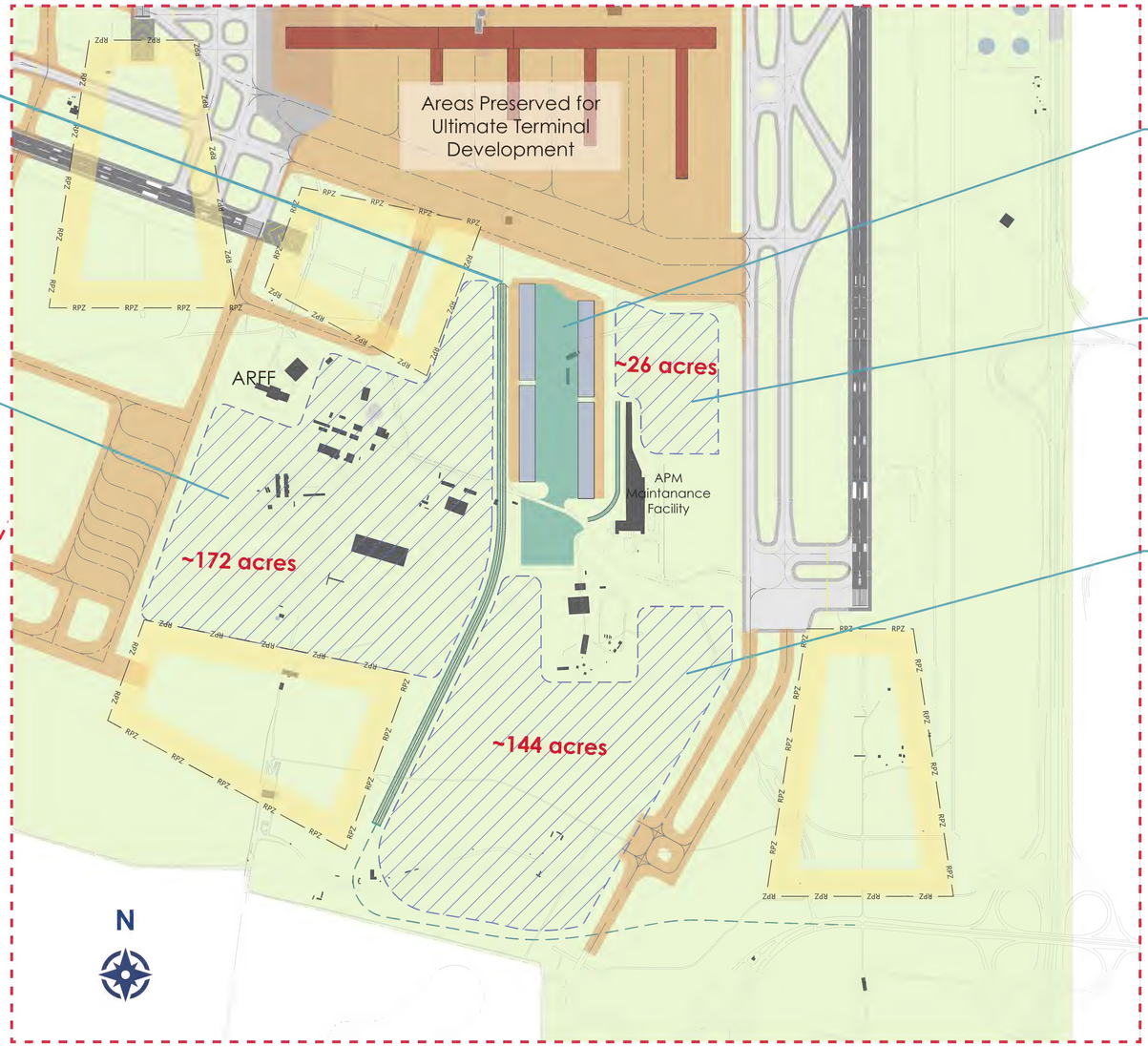
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Southside Development Opportunities

Proposed Terminal Access Tunnel

Area Prioritized for Long-Term Aeronautical Development and/or Support Facilities





Proposed Belly Cargo Complex

Area Prioritized for Aeronautical Development

Area Prioritized for Intermediate-Term Aeronautical Development and/or Support Facilities

LEGEND
- Existing Pavement
- Existing Building
- Future Airside Pavement
- Future Landside Pavement
- Future Landside Building
- Future Terminal/Concourse
- Future Cargo Building
- Potential South Development Area
- Future Taxiway Centerline
- Existing AOA Fence

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Cargo Development Alternatives

Alternative 3:
Immediately North of AeroTrain Maintenance Facility

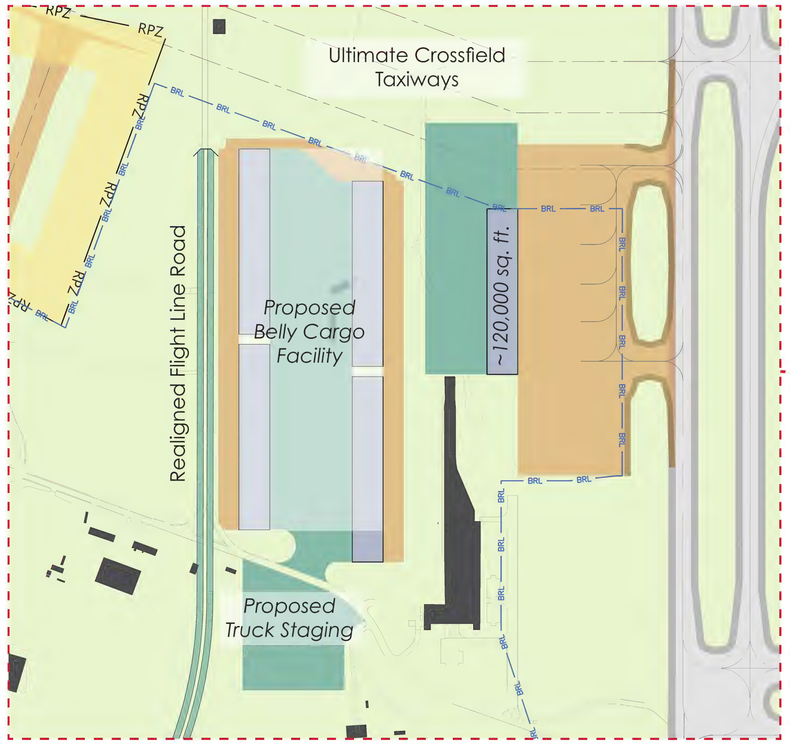
Advantages:
- Could serve either all-cargo or belly cargo airlines
- Site is available for immediate development
- Optimizes cargo handling operations and travel times
- Leveraging existing roadway and utility infrastructure
- Ability to accommodate widebody aircraft

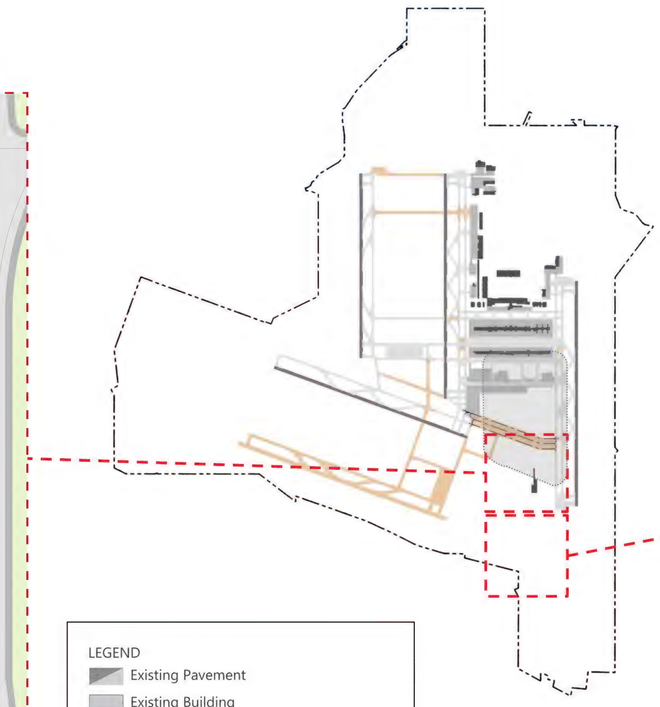
Disadvantages:
- Would not meet 2045 requirement
- Aircraft parking north of warehouse would eventually be displaced to support future terminal expansion
- Requires capital investment to be amortized

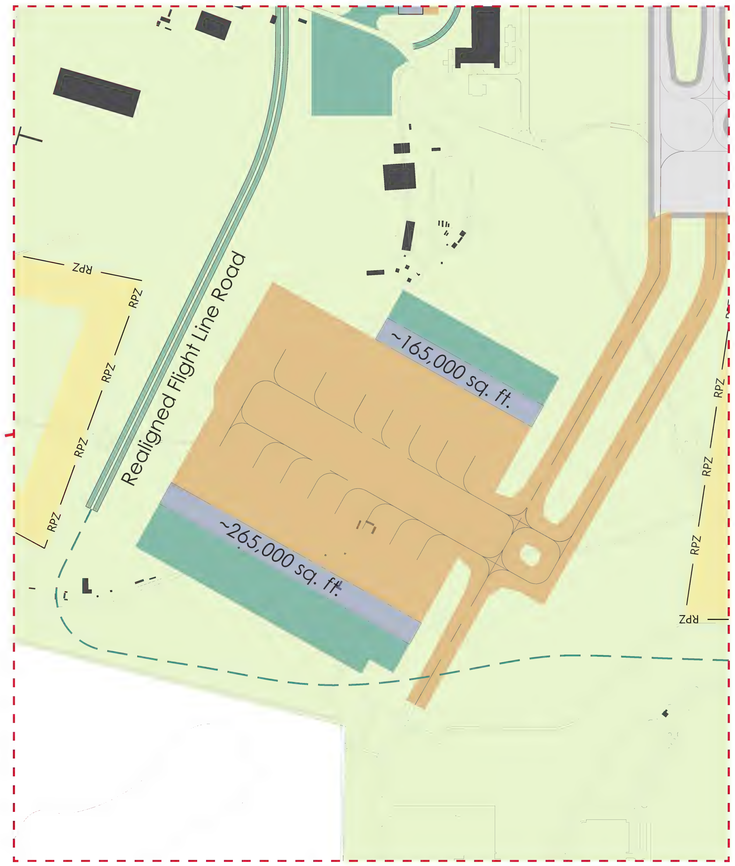
Alternative 4:
North of Smithsonian's Air and Space Museum Annex

Advantages:
- Prioritized for all-cargo airlines
- Optimizes cargo handling operations and travel times
- Ability to accommodate one widebody aircraft
- Would exceed the 2045 requirement

Disadvantages:
- Requires improvements to roadways, utilities, and airfield infrastructure
- Requires capital investment to be amortized







LEGEND
- Existing Pavement
- Existing Building
- Future Airside Pavement
- Future Landside Pavement
- Future Landside Building
- Future Terminal/Concourse
- Future Cargo Building
- Potential South Development Area
- Future/Ultimate Taxiway Centerline

N

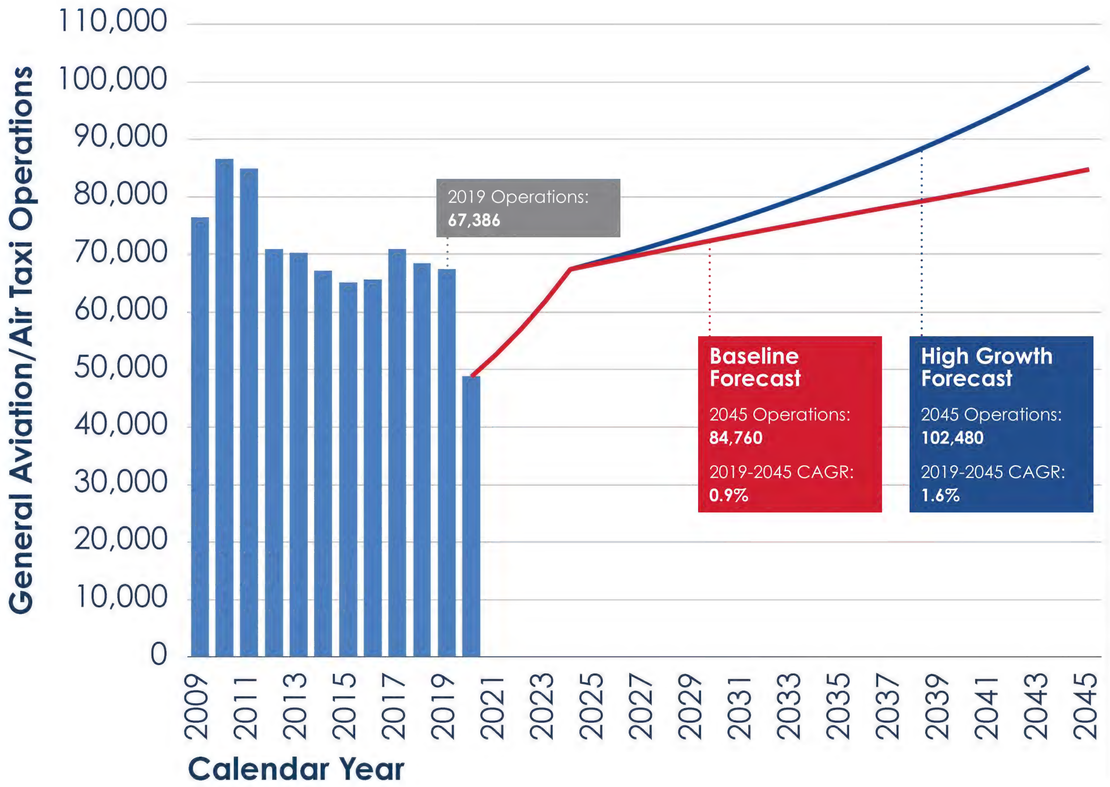
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General Aviation Forecasts

General Aviation Based Aircraft

Year	Single Engine	Multi Engine	Jet	Helicopter	Total
2019	7	6	56	2	71
2025	7	6	66	3	82
2030	8	6	78	3	95
2035	8	6	90	3	107
2040	9	6	102	3	120
2045	9	6	114	3	132
CAGR 2019 – 2045	1.0%	0.0%	2.8%	1.6%	2.4%

General Aviation Operations



Master Plan Focus

- Construct additional facilities to accommodate future growth
- A total of 126 acres anticipated to meet 2045 demand (High Growth)

Legend

- Historical
- Baseline Forecast
- High Growth Forecast

NOTE:
CAGR - Compound Annual Growth Rate

SOURCES: Metropolitan Washington Airport Authority, October 2020; Federal Aviation Administration OPSNET, July 2021; Innovata, July 2021; Ricondo & Associates, Inc., July 2021.

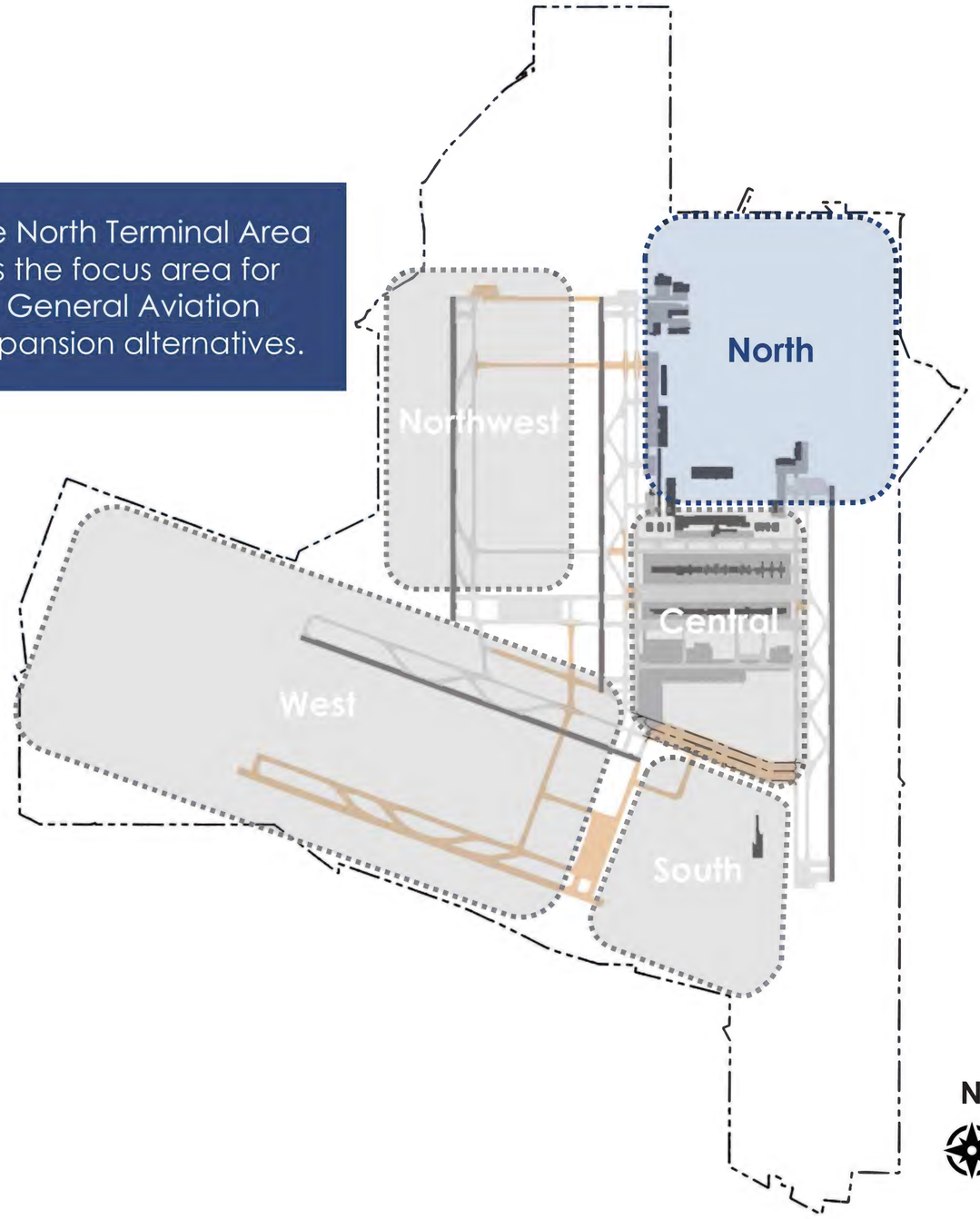
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General Aviation Alternatives Focus

General Aviation Development Goals and Priorities:

- Construct additional general aviation facilities to meet projected demand
- Maintain and enhance IAD's role as a premier corporate general aviation aircraft base and destination
- Provide contingency plans for potential fluctuations in the local general aviation market

The North Terminal Area is the focus area for General Aviation expansion alternatives.

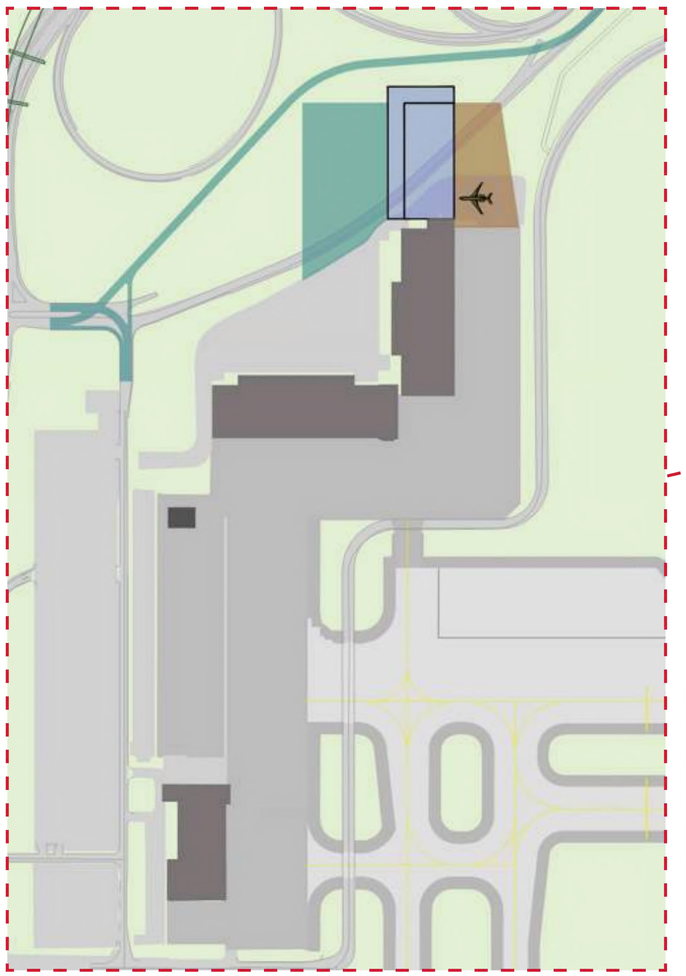


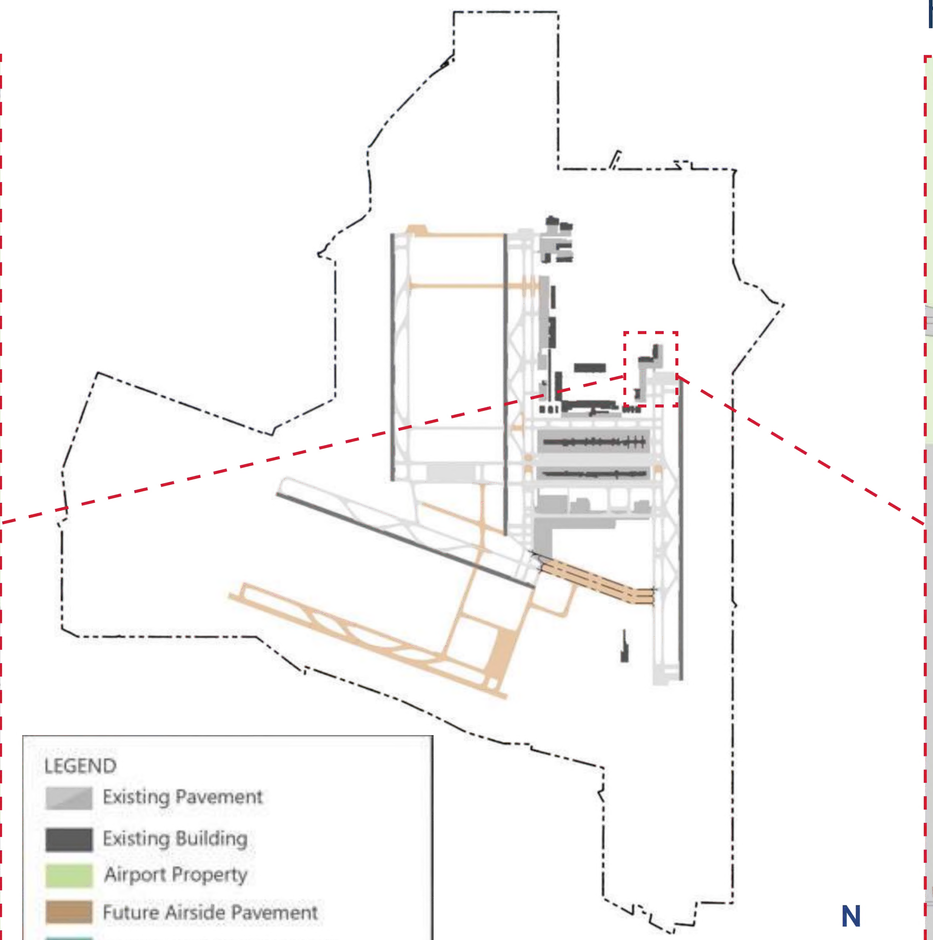
Warehouse Requirements	Existing	2045
Total Acreage[1]	65.2	113.8

Note: Total acreage includes requirement for whole site including provisions for automobile parking and general landscaping/'drainage systems.

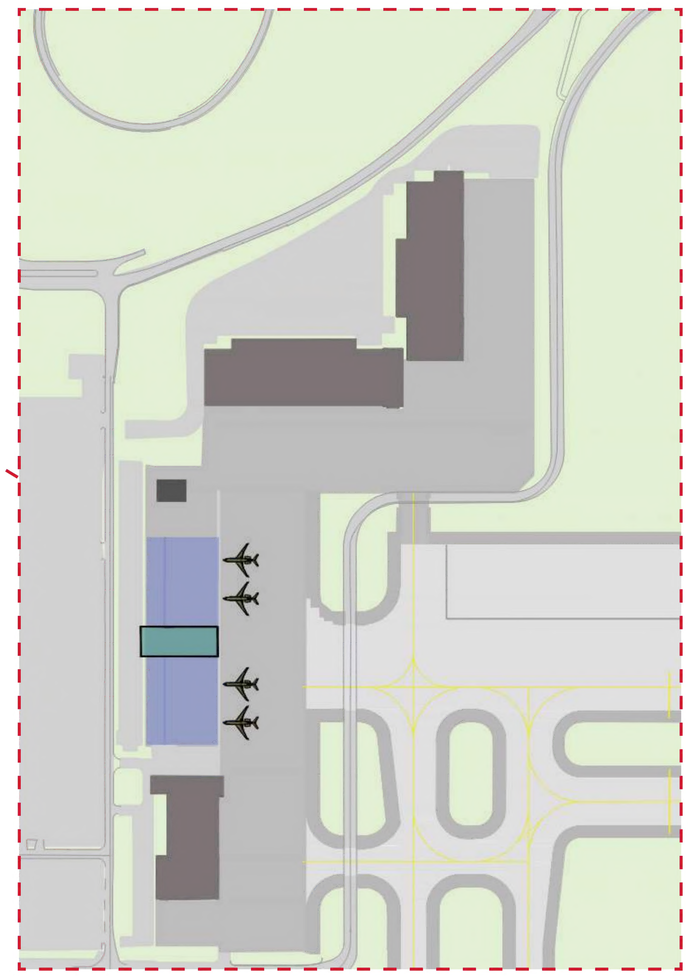
General Aviation Development Opportunities

Site 1
Dulles Jet Center





Site 2
FBO Leasehold #1

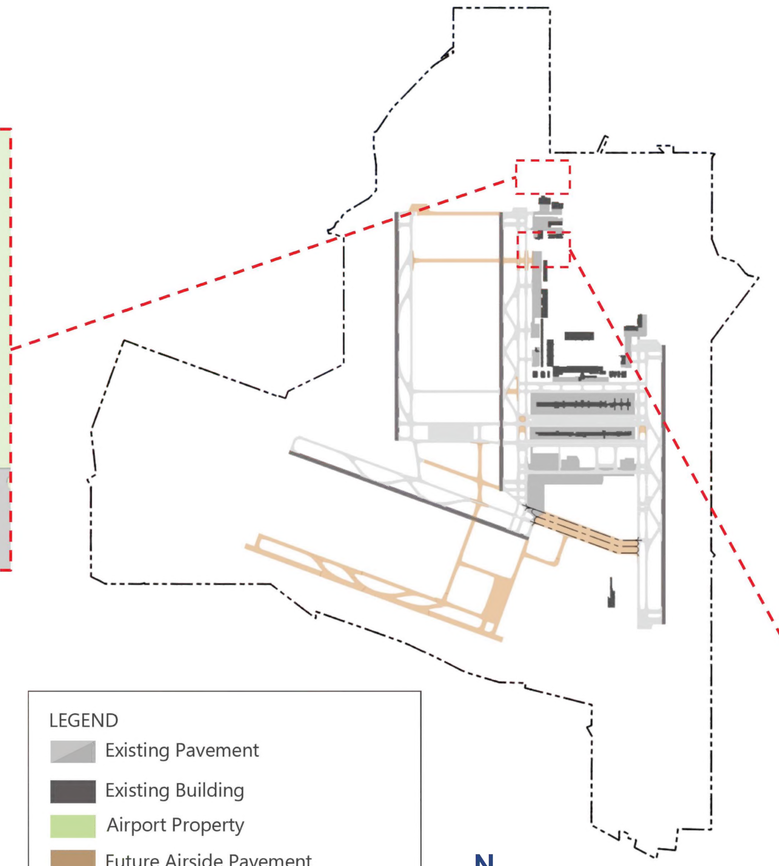


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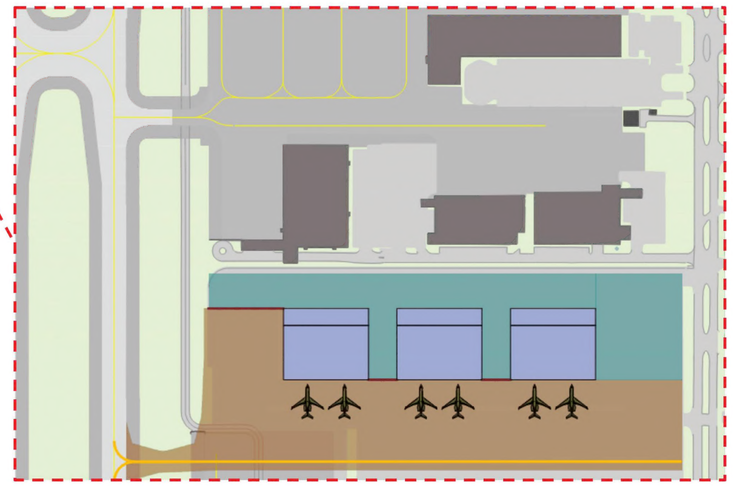
General Aviation Development Opportunities

Site 3
Taxi Dispatch Lot



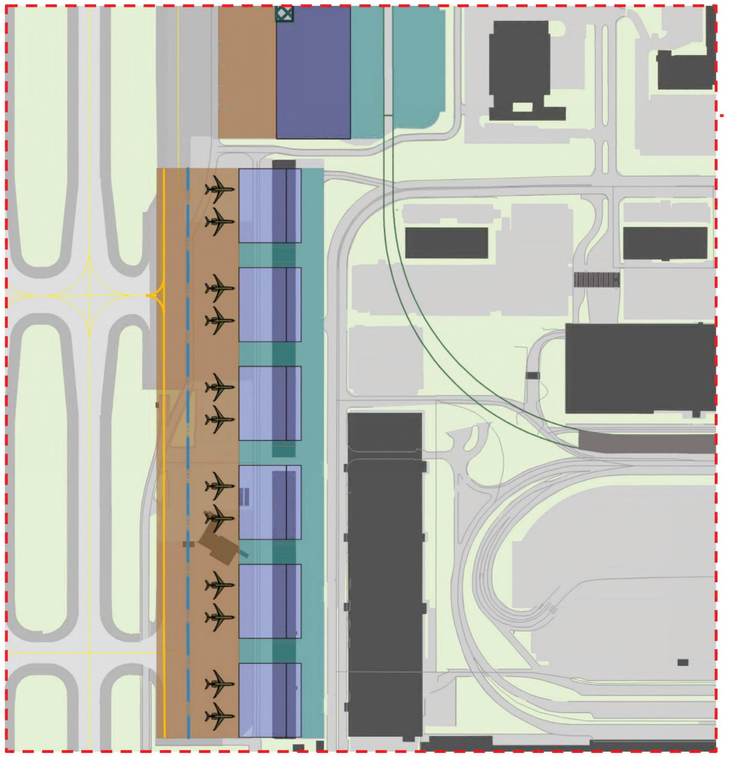


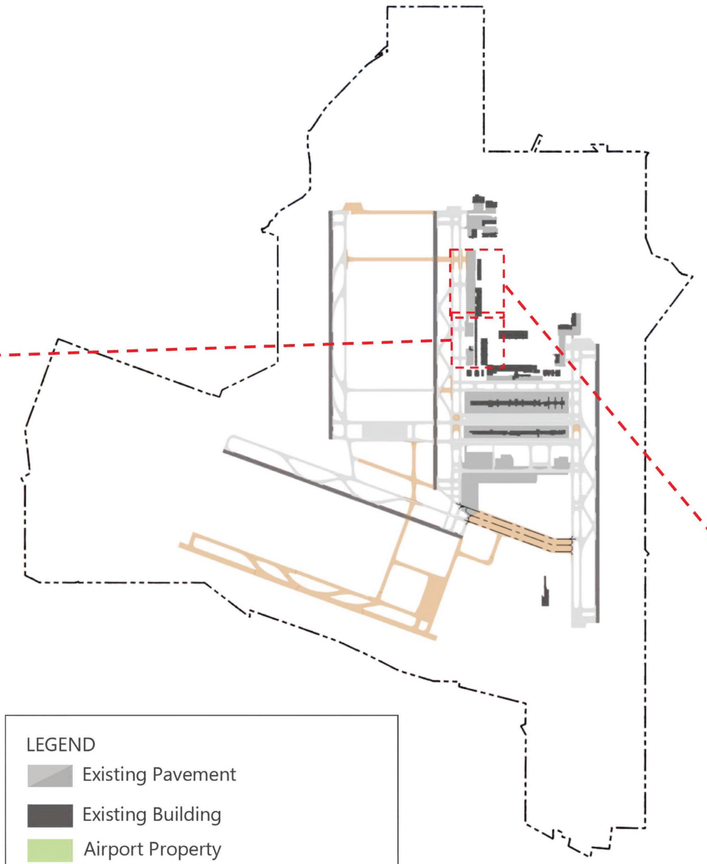
Site 4
FBO Leasehold #2 (South)



General Aviation Development Opportunities

Site 5
Cargo Buildings 1-4

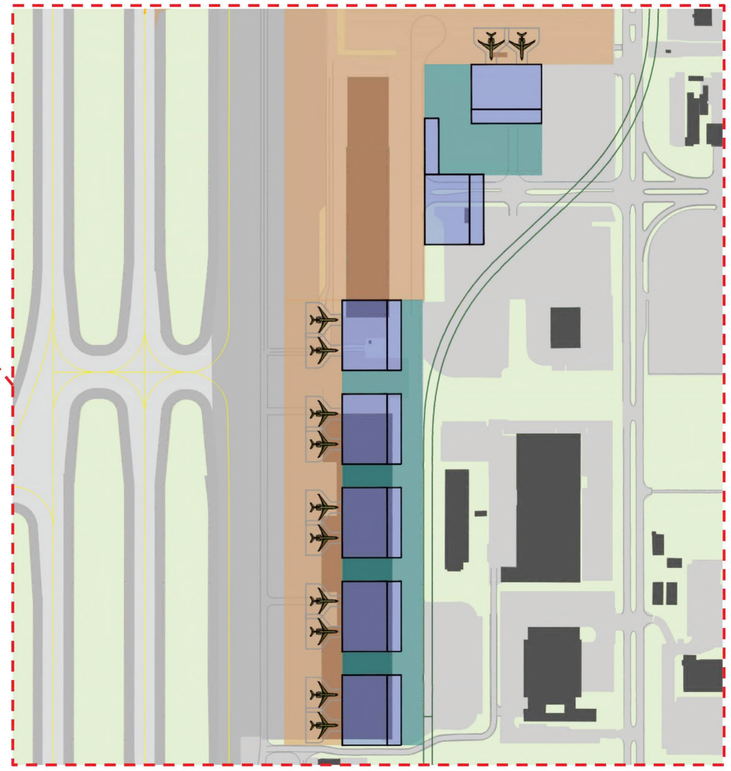




LEGEND
- Existing Pavement
- Existing Building
- Airport Property
- Future Airside Pavement
- Future Landside Pavement
- Future Building

N

Site 6
Cargo Buildings 5 and 6



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https://www.flydulles.com/about-airport/master-plan/dulles-international-airport-master-plan

